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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,610

02/06/2004

Akira Yamanaka

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03/19/2008

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SUITE 3400

CHICAGO, IL 60661

EXAMINER

BAYARD, EMMANUEL

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

03/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/773,610

**Applicant(s)**

YAMANAKA ET AL.

**Examiner**

Emmanuel Bayard

**Art Unit**

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This is in response to Notice of Appeal filed on 11/27/08 in which claims 1-17 are pending. The finality filed on 8/30/07 has been withdrawn based on applicant's arguments. However applicant's arguments are not based on a new ground of rejection.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al U.S. Patent No 5,052,000.

As per claim 1, Wang et al teaches a method for equalization in a communications system, the method comprising: removing post cursor inter-symbol interference within at least one error correction code word in a block code based error correction scheme (see abstract and fig.2 element 210 and col.1, lines 63-67 and col.5, lines 13-38), wherein said block code based error correction scheme is utilized in the communication system (see col.2, lines 18-20).

As per claim 2, Wang et al teaches, wherein said removing of post cursor inter-symbol interference comprises removing symbol interferences from at least one previous error correction code word utilizing a decision feedback equalization filter (see fig.2 element 210 and col.5, lines 13-38).

As per claim 3, Wang et al teaches, wherein said removing of post cursor inter-symbol interference comprises utilizing distortion filtering in said decision feedback equalization filter, for generating filtered symbols (see fig.2 element 214 and col.5, lines 23-36).

As per claim 5, Wang et al inherently teaches, wherein said removing of post cursor inter-symbol interference comprises adding scalar terms (see fig.2 element 212 and col.5, lines 23-36) for each of said at least one error correction code word to a decision metric (see col.7, lines 28-30) of a real part of a projection of said filtered symbols to said at least one error correction code word.

As per claim 6, Wang et al teaches A system for equalization in a communications system, the system comprising: a modulation system utilizing a block code based error correction scheme (see fig.2 element 200 and col.3, lines 16-20); and a feedback equalization filter provided within said modulation system for removing post cursor inter-symbol interference within at least one error correction code word to make at least one code word decision in said block code based error correction scheme (see abstract and fig.2 element 210 and col.1, lines 63-67 and col.5, lines 13-38).

As per claim 7, Wang et al teaches, wherein said feedback equalization filter removes symbol interferences from at least one previous error correction code word (fig.2 element 210 and col.1, lines 63-67 and col.5, lines 13-38).

As per claim 8, Wang et al teaches, wherein said feedback equalization filter comprises a distortion filter that generates filtered symbols (see fig.2 element 214).

As per claim 10, Wang et al inherently teaches comprising a decision metric (see col.7, lines 28-30) for said feedback equalization filter, wherein scalar terms are added (see fig.2 element 212 and col.5, lines 23-36) for each of said at least one error correction code word to a decision metric of a real part of a projection of said filtered symbols to said at least one error correction code word.

As per claim 11, Wang et al teaches a method for equalization in a communications system, the method comprising: performing block code based error correction during signal modulation in the communications system (see fig.2 and col.1, lines 44-50 and col.3, lines 16-20); and making at least one code word decision (see col.2, lines 110) with minimum error power-based criteria during said block code based error correction with a decision feedback equalization filter that removes post cursor inter-symbol interference within at least one error correction code word (see abstract and fig.2 element 210 and col.1, lines 63-67 and col.5, lines 13-38).

As per claim 12, Wang et al teaches wherein said making of said at least one code word decision comprises utilizing said decision feedback equalization filter (fig.2 element 210 and col.1, lines 63-67 and col.5, lines 13-38) to remove symbol interference from at least one previous error correction code word.

As per claim 13, Wang et al teaches wherein said making of said at least one code word decision comprises utilizing a distortion filter(see fig.2 element 214) in said decision feedback equalization filter, for generating filtered symbols.

As per claim 15, Wang et al inherently teaches, comprising utilizing a decision metric (see col.7, lines 28-30) for said decision feedback equalization filter, wherein

Art Unit: 2611

scalar terms are added (see fig.2 element 212 and col.5, lines 23-36) for each error correction code word to a decision metric of a real part of a projection of said filtered symbols to said at least one error correction code word.

As per claim 16, Wang et al teaches, wherein said block code based error correction scheme is utilized in a modulation system of the communication system(see fig.2 element 200 and col.3, lines 16-20).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al U.S. Patent No 5,052,000 in view of Yen U.S. Pub No 2003/0123,586 A1.

As per claims 4, 9 and 14, Wang et al teaches all the features of the claimed invention except wherein utilizing distortion filtering further comprises inserting a matrix multiplication-based filter after a feed forward equalizer filter and a feedback filter in the modulation system for symbol interference from the symbols in previous error correction code words.

Yen teaches inserting a matrix multiplication device is the same as the claimed ( a matrix multiplication-based filter) after a feed forward equalizer filter and a feedback filter in the modulation system for symbol interference from the symbols in previous

Art Unit: 2611

error correction code words (see fig.5 element 542 and page 1 [0011] and page 3 [0032-00035]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Yen into Wang et al as to make the maximum possible detection and increase the capability of receiving as taught by Yen (see page 4 [0037]).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al U.S. Patent No 5,052,000 in view of in view of Wei et al U.S. Pub no 2004/0125884 A1.

As per claim 17, Wang et al teaches all the features of the claimed invention except selecting a code word for said block code based error correction scheme, based on said removing of post cursor inter-symbol interference within said at least one error correction code word.

Wei et al teaches selecting a code word for said block code based error correction scheme, based on said removing of post cursor inter-symbol interference within said at least one error correction code word (see page 1 [0004-0005], [0011]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Wei into Wang as to provide tentative decisions designated to find symbol

from the signal constellation closest to the ideally ISI free receive signal sample as taught by Wei (see page 2 [0014]).

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
8. Liao et al U.S. Patent No 5,546,430 teaches a detector for demodulating.
9. Sallaway et al U.S. Patent No 7,050,517 B1 teaches a system and method suitable for receiving Gigabit.
10. McEwen et al U.S. Pub No 2002/0116667 A1 teaches adjusting a clock signal.
11. Smee et al U.S. Pub no 2003/0223489 A1 teaches a receiver with decision feedback equalizer.
12. Clark U.S. patent No 7,212,569 B1 teaches a frequency domain decision feedback equalizer.
13. Singwall U.S. Patent No 6,898,239 B2 teaches a method of detecting a sequence of information.
14. Kim et al U.S. Pub no 2004/0131109 A1 teaches bidirectional turbo ISI canceller.
15. Schmidt et al U.S. Pub No 2003/0161421 A1 teaches interference reduction in CCK.
16. Ling et al U.S. Patent NO 6,167,082 teaches adaptive equalizers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272



Art Unit: 2611

3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)

Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571 272 3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

2/22/2008

Emmanuel Bayard  
Primary Examiner  
Art Unit 2611

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